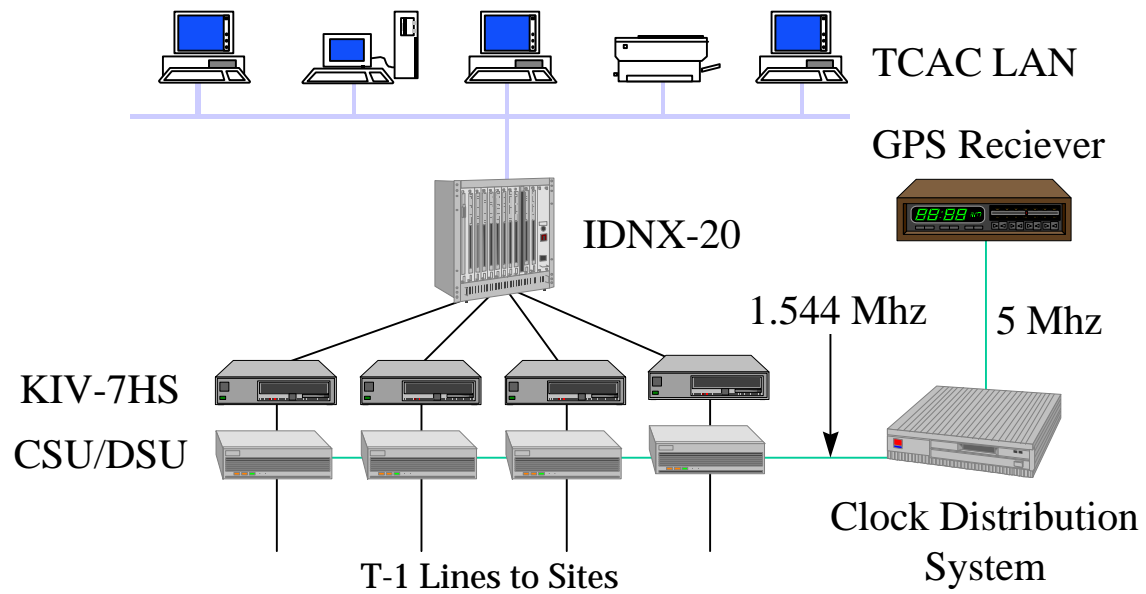


BACKGROUND PAPER  
ON  
THE JADS JTF WIDE AREA NETWORK (WAN)

This background paper describes the TCAC Network and its components. It first discusses the components of the network and describes the functions of the major pieces of equipment. The TCAC network can be broken into three distinct segments. There is the Local Area Network (LAN), the Wide Area Network (WAN), and the Clock Distribution System (CDS). The LAN is a 10baseT network comprised of a mixture of UNIX workstations and IBM compatible personal computers (PCs). The workstations and PCs are linked together through two network hubs. Each computer is connected to a distribution harmonica in the TCAC that is cabled to a patch panel in the communications room which is connected to the network hubs. The WAN is a T-1 based network that connects the remote sites to the TCAC. It is comprised of VERILINK Channel service Units (CSU), Allied Signal KIV-7HS encryptors, and Network Equipment Technologies Integrated Network Digital Exchange (IDNX) circuit based switch. The CSU interfaces the KIV-7HS to the T-1 line by converting the Non-return to zero (NRZ) output of the KIV-7HS to a bipolar alternate mark inversion signal for transmission over the carrier facilities. The KIV-7HS is a National Security Agency (NSA) certified link encryption device that is used to protect the data being transferred between the sites in the TCAC Network. The IDNX is a circuit based switch that integrates the functions of a router and a multiplexor into a single unit. The router portion is connected to the network hubs used in the TCAC LAN. The IDNX is also used to monitor the status of the WAN via its control port. The CDS is used to synchronize all the equipment in the WAN to the same timing source. It is vital that the network be slaved to the same timing signal in order to maintain sync and prevent bit errors caused by differences in timing in the WAN equipment. The CDS is comprised of three components. The Global Positioning System (GPS) receiver, Fiberplex Timing Distribution System, and the CSUs. The GPS receiver is a Stratum level 1 time source that is provided by the GPS satellite constellation. It has 1 Megahertz, 5 Megahertz, and 10 Megahertz outputs for use by timing distribution systems. The Fiberplex Timing Distribution System uses the outputs from the GPS receiver and divides them down to usable frequencies for use by communications equipment. It also has a Stratum level 2 oscillator built in for use in case the GPS receiver fails.

The CSUs use a 1.544 Megahertz output from the Timing Distribution System to externally clock the T-1 lines and the IDNXs. The CSUs at the distant sites are configured to recover timing from the T-1 line and pass it through to the distant IDNX. Thus, ensuring that all communications equipment in the network is traceable to the GPS source in the TCAC.



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